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ABSTRACT

Two approaches were used to predict State Board Examinations (SBE) results for students in four schools of nursing. Multiple regression was used to predict scores of 191 nurses who graduated and took the SBE. Discriminant function analysis was used for 375 nursing students to predict students who would take and pass the SBE from those who would not. Important predictor variables for both techniques included: 1) G.P.A., 2) test anxiety, and 3) student grade expectation. (Author)

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PREDICTING SBE RESULTS FOR ASSOCIATE DEGREE NURSING STUDENTS

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Two approaches were used to predict State Board Examinations (SBE) results for students in four schools of nursing. Multiple regression was used to predict scores of 191 nurses who graduated and took the SBE. Discriminant function analysis was used for 375 nursing students to predict students who would take and pass the SBE from those who would not. Important predictor variables for both techniques included: 1) G.P.A., 2) Test Anxiety, and 3) Student grade expectation.

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Objectives: This study was designed to find optimum variables for predicting 1) students who will eventually take and pass the State Board Examination and 2) SBE scores for students who graduate and take this exam. Many previous studies in this area have used only single variables as predictors. Of those studies which have used multivariate techniques, accuracy of prediction has significantly increased. However, despite the advances in statistical analysis and computer utilization, prediction of SBE results can be improved only with increased knowledge of the cognitive and non-cognitive variables related to the SBE. Using these variables, prediction equations could be developed for selecting students for admission according to their potential for taking and passing the SBE.

Method and Data Sources: Previous prediction studies were reviewed to identify academic, psychological, and sociological indicators of success on the State Board Examination. Through preadmission data and special testing, 21 variables were obtained from 375 nursing students entering four schools of nursing in 1970. These 21 variables included: 1) age, 2) test anxiety, 3) creativity (total score), 4) creativity (factor 1), 5) creativity (factor 2), 6) father's education, 7) mother's occupation, 8) high school science average, 9) high school math average, 10) advanced education, 11) marital status, 12) licensed practical nurse experience, 13) probation status at time of admission, 14) student lowest acceptable grade for Anatomy, English Composition, Fundamentals of Nursing, Psychology, and Microbiology, 19) first semester GPA, 20) first year GPA, and 21) second year GPA.

The statistical approaches of discriminant function and multiple regression were used in four stages of the nursing program. In stage 1, variables 1-18 were used; stage 2, variables 1-18 plus variable 19 (first semester GPA); stage 3, variables 1-19 plus variable 20 (first year GPA); and stage 4, variables 1-20 plus variable 21 (second year GPA).

The discriminant function approach used these variables to discriminate students who would take and pass the SBE from students who either do not take or failed the SBE. These predictions were done at each stage for the five nursing areas on the SBE. These areas included medicine, surgery, obstetrics, pediatrics, and psychiatric nursing. In stage 1, predictions were done for 375 students who entered the nursing program; stage 2, 341 students who completed the first semester; stage 3, 296 students who completed a full year; and stage 4, 191 students who completed the two years and took the SBE. The total number of subjects decreased as fewer numbers of students completed each stage.

In the multiple regression analyses, a battery of input variables was analyzed step-wise as predictors. The multiple regression equation indicates the relationship between the prediction battery and the dependent variable, in this case, scores for the five SBE areas. This approach was used through each of the four stages using only the 191 nurses who took the SBE immediately after graduating in 1972.

Previous research has shown weights used in discriminant function and multiple regression techniques to be directly proportional.

Results: Variables used in multiple regression and discriminant function techniques were rated according to their entrance into their respective prediction batteries. Three points were given each time a variable entered the battery as the single best predictor. Two points were assigned

to other variables entering with an F-value of 2.73 or more. One point was given each time the variable entered the prediction battery with an F-level of 1.00 or more. These rankings were done at each of the four stages on each of the five SBE areas.

Using discriminant function the variables with the highest ranks used in predicting students who would take and pass the SBE were: 1) marital status, 2) test anxiety, 3) age, 4) high school math average, and 5) first semester GPA. The percentage of students classified correctly for each stage were: Stage 1, 66%; Stage 2, 79%; Stage 3, 79%; and Stage 4,81% as determined from the results of the hit-miss tables.

Using step-wise multiple regression the variables with the highest ranks used to predict SBE scores were: 1) first year GPA, 2) lowest acceptable grade for Anatomy, 3) probation status at time of admission, 4) test anxiety, and 5) lowest acceptable grade for Microbiology. The highest multiple regression correlation for each stage was: Stage 1, .48; Stage 2, .66; Stage 3, .60,and Stage 4, .62.

It is interesting to note the type of variable ranked as most important in each technique. The three highest ranking variables (marital status, test anxiety and age) used in predicting students who would graduate and take the SBE were not specifically related to measures of achievement status; however, the three highest ranking variables (first year GPA, lowest acceptable grade for Anatomy, and probation status at time of admission) used to predict SBE scores were related to achievement status.

Importance: Several cognitive and non-cognitive measures were shown to be useful in predicting SBE results. It appears that both cognitive and non-cognitive measures were good predictors of SBE scores. For

predicting students who will eventually graduate and pass the SBE, again both cognitive and non-cognitive measures were valuable. Students who are married and students who are somewhat older than the average college student are less likely to drop out after entering a nursing school. Hence, when selecting students for admission into nursing schools, these students should be given special consideration.